FIG. 1

FIG. 2A

FIG. 2B

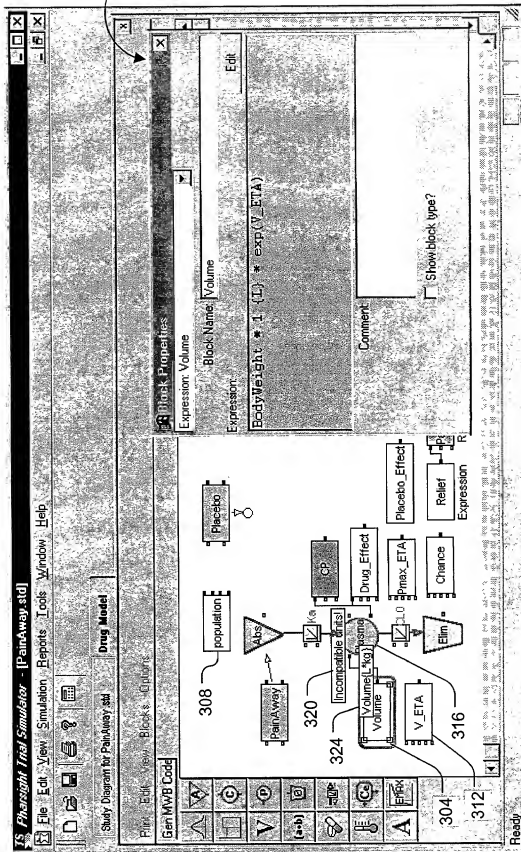FIG. 3

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Const	a numeric constant
NamedConst	a numeric constant having a name, such as Male or Female
StrConst	a string constant such as 'this is a string'
Unit	a basic unit such as L(liters) or d(days)
GetPort	a reference to the value of a variable
Trinop	trinary operator, such as the conditional operator
Binop	binary operator, such as +, -, *, /, comparison, etc.
Unop	unary operator, such as unary minus, and logical .not.
TimesUnit	multiplication by a unit phrase
UnitBinop	binary unit operator, such as *, /
UnitPhrase	encapsulates a unit phrase
DelayFunc	the delay function. It's output equals its input delayed by an offset.
TableFunc	the tabular function.
Funcall	calls one of a set of built-in functions, such as sqrt, exp, ln, etc.
SetPort	stores a value into a variable
SetDerv	sets the derivative (rate of change) of a variable
DEvent	represents the action to be performed when an event fires.
CDistr	represents a univariate continuous distribution.
DDistr	represents a univariate categorical distribution.
DLogit	represents a categorical distribution determined by an input value, some offset values, and a link function.
Choose	represents block equivalent of the trinary conditional expression.
Subrcall	represents a call to an external user-written subroutine.
NewStmtSequence	represents a sequence of statements
StmtIfThenElse	represents an if-then-else statement
InitCF	initializes a closed form machine by setting its initial parameters.
Add1stOrdCF	modifies a closed form machine by convolving its parameters with a first order delay.
Add1stOrdInputCF	modifies a closed form machine by convolving its parameters with a first order delay.
CloneCF	copies one closed form machine into another.
GetValCF	reads the value of a closed form machine
AddDoseCF	adds a bolus dose to a closed form machine
AddRateCF	adds to the infusion rate in a closed form machine
IfLevel	a special if statement used to guard statements, causing them to only be executed at the proper distribution level, such as continuous, event, periodic, etc.
SetDiscrete	used to set a group of categorical variables that are jointly distributed.
DSwitch	used to choose among a set of continuous values on the basis of a set of discrete values.
MCorDistr	represents a multivariate continuous distribution with correlation matrix
MVarDistr	represents a multivariate continuous distribution with variance-covariance matrix.
MVarImport	represents a set of variables that are being imported.

FIG. 4

FIG. 5

FIG. 6

FIG. 7A

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Equations

Equation Numbers?
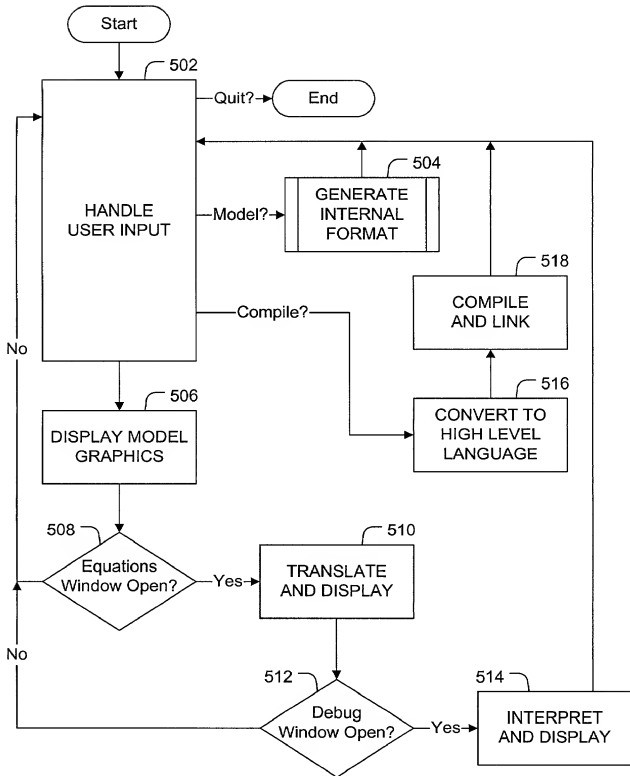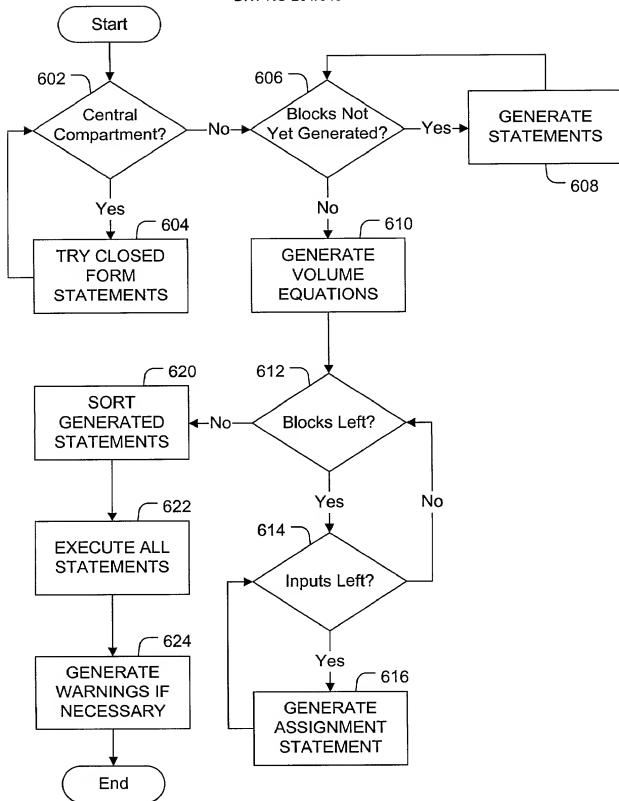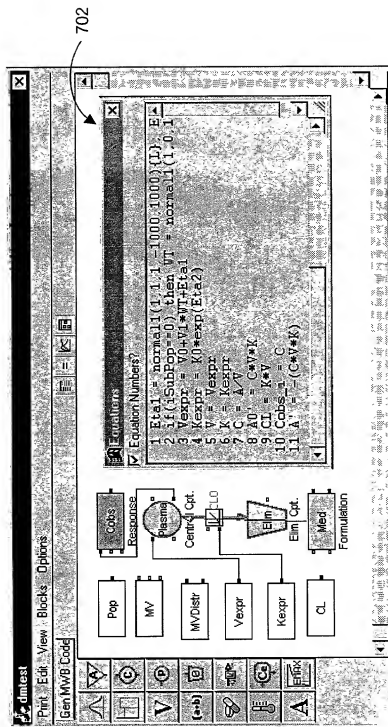
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1) if(iSubPop>0)'then switch(SetDiscrete1(ddistr(2, 0.51, 0.49), Gender: 2), BodyWeight: no
2) Al = n/(A*ka)
3) Temp_00 = normal1(1,V_ETA_mean,V_ETA_sd,V_ETA_lo,V_ETA_hi)
4) V_ETA = V_ETA_null*Temp_00
5) Volume = BodyWeight*(1/kg)
6) Temp_01 = normal1(1,Pmax_ETA_mean,Pmax_ETA_sd,Pmax_ETA_lo,Pmax_ETA_hi)
7) Pmax_ETA = Pmax_ETA_null*Temp_01
8) Placebo_Effect = 0.3
9) Temp_02 = uniform(1,Chance_lo,Chance_hi)
10) Chance = Chance_null*Temp_02
11) Relief = 1
12) V = Volume
13) Pain_Relief_i = Relief
14) C = Al/V
15) A0' = C*Cl
16) CP_1 = C
17) Drug_Effect_C = C
18) Al' = A*ka-C*Cl
19) Drug_Effect = Drug_Effect_Emax*Drug_Effect_C**Drug_Effect_Hill/(Drug_Effect_EC50**Drug_Ef
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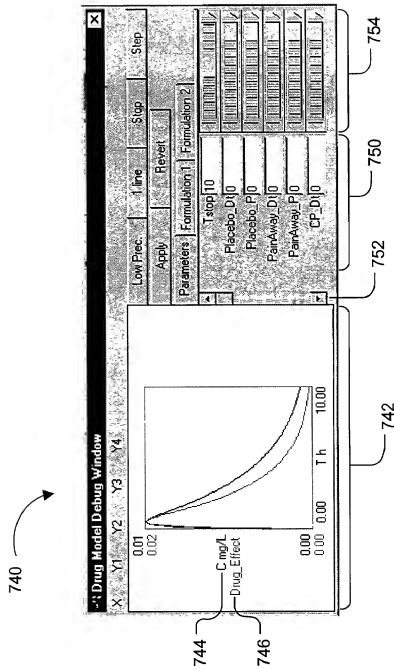
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FIG. 7B

FIG. 7C

FIG. 7D

FIG. 8